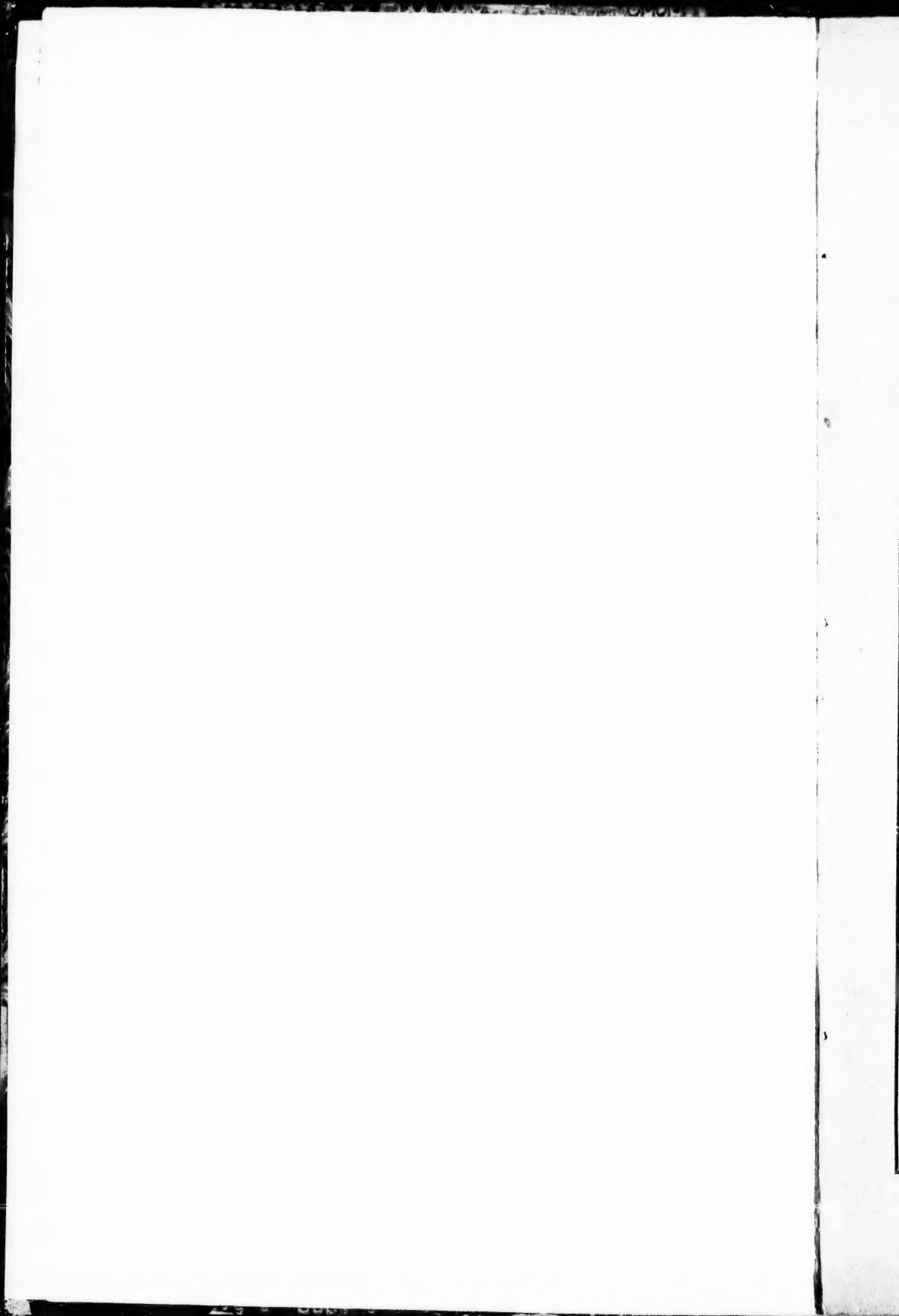




A LETTER
TO THE
PRESIDENT OF THE U. STATES OF AMERICA
PROPOSING A METHOD WHEREBY THE MERITS OF
THE CONFLICTING CLAIMS OF
THE UNITED STATES AND GREAT BRITAIN,
ON THE DISPUTED FRONTIER,
MAY BE CORRECTLY EXAMINED AND DETERMINED, BY SCIENTIFIC
PRINCIPLES, COMBINED WITH INDISPUTABLE DATA,
GROUNDED IN EQUITY;
TOGETHER WITH AN EXAMINATION OF
THE TREATY OF 1783:
FROM WHICH IS DERIVED A DEMONSTRATION OF THE FALSEHOOD OF
THE BRITISH CLAIM.

BY JOHN LEE,
DECYPHERER OF THE CHARTER OF OMAGH, AND AUTHOR OF PROPORTIONAL
FORMULÆ, THEORY OF LONGITUDE, AND A TREATISE ON THE
ERRORS OF THE RECTANGULAR SURVEY.

*" Ἀλλὰ δ' ἐν στήθεσσι τίθει νόον εὐρύοπα ζεύς
Εσθλὸν, τοῦ δὲ τε πολλοὶ ἐπανόσκοντ' ἄθρονοι,
Καὶ τε πόλεις ἐσάωσε." — Iliad, Lib. XIII.*

"I, wisdom, dwell with prudence, and find out knowledge of witty inventions." — PROVERBS, viii. 12.

"Wisdom is better than weapons of war." — ECCLESIASTES, ix. 18.

CAMBRIDGE:
METCALF, TORRY, AND BALLOU.
1839.

A LETTER

TO

THE PRESIDENT OF THE UNITED STATES OF AMERICA

FROM

THE SECRETARY OF THE ARMY

ON THE SUBJECT OF THE PROPOSED

CONSTRUCTION OF A RAILROAD

FROM THE CITY OF WASHINGTON TO THE CITY OF NEW YORK

AND

THE

SECRETARY OF THE ARMY

3446

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CAMBRIDGE:
METCALF, TORRY, AND BALLOU.
1839.

To the Hon

Simon Greenleaf,

Respectfully

Presented From

The Author.

5-5-217

Entered, according to act of Congress, in the year 1839, by METCALF,
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A LETTER

TO HIS EXCELLENCY THE

PRESIDENT OF THE UNITED STATES OF AMERICA.

SIR :

THE conspicuous majesty of Science is now recognised from nation to nation, and from clime to clime, through the circuit of the habitable universe. From her intellectual throne she sways the destinies of men. In the remote and tranquil scenes of rural cultivation; in the busy throng of traffic and the ceaseless reverberating din which pervades the commercial cities; on the vast and solitary surface of the undulating deep; in the barriers of eternal polar ice, or the impenetrable silent horrors of subterrestrial gloom; through all the confines of the sublunary world, she claims ubiquity of empire. That portion of our being, which we inherit from divinity, has been, by the discipline of Science, developed in such magnificence of energy as clearly marks its origin; while the petty powers of our *animal* constitution have sunk to comparative nonentity. In the conflict of battle, and the agonizing shock of war, the achievements of corporeal prowess are beheld no more; the mail-protected rank of heroes has dwindled into puny insignificance, before the vast machinery of destruction which Science has created and arrayed upon the martial field; she impels, with invisible and superhuman arm, the flame-winged missiles which annihilate legions, and crush the pride of castellated bulwarks with irresistible and ruinous prostration.

This development of the mental energy of man, though its recent progress to maturity be characterized with gigantic and

marvellous rapidity, is no precipitate result of late or sudden causes. It is the gradual growth and final fructification of the *tree of Knowledge*, through the total extent of a period which has nearly comprehended six thousand years. Through the reckless and barbarian atheism of lawless unconfederated man; through the mystic incantations and fantastic horrors which mark the fearful rites of idolatrous bewildered nations; and in later times, through all the seductive sophistry and blasphemous impiety of audacious and perverse philosophy; like the vegetative bud which survives the changes of the atmosphere, the intellectual germ has resisted every ungenial influence of place and time, and preserved its undecayed vitality, to attain the plenitude and lustre of autumnal exuberance and bloom.

And, therefore, when contrasted with the flaming splendor which illuminates the annals of science in the present age, the page of *ancient* history is not *completely* desolate and dark. Through the mist of intervening ages, the achievements of the peerless *Archimedes* present a monumental prototype of almost every marvellous phenomenon, which, by the aid of science, is created on the theatre of nations in the present day. His caustic apparatus and projectile engines refer the imagination, by a simultaneous and triple analogy, to the sudden flash and heavy roar of the cannon, to the lightning and thunder of the electric machine, and the irresistible energy which results from the concentration of the optic ray. His investigations in the theory of motion, equilibrium, and impulse, have served as a basis for all that we now know in mechanical science, through all its modifications and departments, comprehending the multitudinous motive powers and impulsive agencies of solid and fluid materials. And in bright and glorious addition to all the preceding discoveries, his daring and sublime excursions, in the intellectual region of *pure Geometry*, through unexplored and solitary tracts of knowledge, but copious and luxuriant in the intrinsic and immortal beauty of the *immutable nature of things*; these intrepid flights of reason have directed the research of every subsequent adventurer on that boundless and eternal field.

Sir, it is not necessary here, to enumerate, in detail, the important services for which celebrity is due to *other* numerous and illustrious names, which adorn the recorded catalogue of scientific labors and lore, through the long and shadowy tract of time comprehended in ancient history ; though the mental faculties of your Excellency must have been, for years, indispensably pre-occupied with all the responsibilities and cares attached to the superintendence of the political affairs of a great and rising nation ; I consider it yet a presumable circumstance, that all the classic recollections, which refer to the development and progress of the human mind from early imbecility to intellectual manhood, have not completely faded from your memory.

Though the extraordinary and startling problem, the performance of which is the professed and immediate object of the present letter, be one which is indeed unexampled in the history of science, the preceding rapid sketch of the continuous movements and incessant researches of the human mind, will, I am disposed to believe, diminish the deep surprise, with which, for the first time, your Excellency, and the public would otherwise receive the intimation of the attempted solution of this problem. By a simple and direct pursuit of the ideal train of associations presented in the preceding sketch, the solution of this problem will easily appear to be *part and parcel* of the connected results of the unquiet and aspiring operations of the *general human mind* ; of that primeval, celestial, and elastic impulse, whereby our universal race and lineage are exalted above the humility of their native dust, to tread, in intellectual pre-eminence, the ulterior confines of the vaulted universe, and contribute recognition and homage to the invisible Architect who dwells beyond.

Sir, I am a native and voluntary subject of the British sovereign ; but few and doubtful are the claims of gratitude, however, which the British nation, or any other, has on *my individual affections* ; this country I have sought, not as a refuge for political disaffection, or a laboratory for the experimental career of a political empiric ; not as the ultimate resource of one who escapes from the horrors of penury, nor

yet as a protecting asylum for an infamous and guilty fugitive; I have directed my steps upon the transatlantic shore, to obtain a refuge, in retirement, from scenes of adversity, and a cessation of the miseries of mental distress; to seek a resting place where sources of private unhappiness may feel the balm of solitude; where the eyes of the depraved rabble may never enjoy that luxury which is deemed intensely grateful to malignity and envy, when permitted to espy the faded lustre of decayed respectability, and the ruinous operations of disastrous and reverted fortune; where the afflicted proud man, when he feels the burning and resistless impulse to relieve and vent his anguish by external or internal tears, may weep in secret and alone.

But while the self-dependent and secluded nature of my present condition compels me to *regard my fealty as my own*, and brook no infringement of my personal rights from any existing human power, when the means of retaliation are accessible; I cling to the belief, that I feel myself too deeply bound by the obligations of moral conscience, by the intrinsic sanctity of justice, by the love of equity which dwells immutably inherent in the virtuous mind, and by the lingering attachments of pre-existing national sympathy which distinguish and adorn the human character, and interpose a true criterion betwixt the magnanimous and the servile spirit; I believe myself too potently restricted by these considerations, to espouse the American claims for the sake of popular favor, in considering the merits of the great international dispute which I propose to examine in this letter.

I must also observe to your Excellency, that, while I conceive myself, in this country, deeply indebted to a few individual friends; yet, from the nation at large, or any section, great or small, of the community, I *derive no favor, and therefore acknowledge no obligation*; I anticipate no advantage, and seek no benefit, *except as the reward of my own exertions*; and few therefore, I presume, can be easily found, who are better qualified by total exemption from "*fear, favor, or affection*," than I am, for the examination of this great question.

Having offered the preceding remarks to your Excellency,

for the vindication of my own character, conduct, and motives, in attempting to determine the merits and dispel the perplexities of this dispute, I now proceed, without further preface or delay, to enter on the field of explanation and decision. And here, in the audible and free communication, and the open conspicuous prospect of the great and general amphitheatre of nations, I avow myself constrained in justice, to give my direct and unequivocal declaration and opinion on the side of the American party in this litigation. I am constrained to acknowledge, that every feature of the British claim so visibly and palpably betrays the stamp of artificial and recent origin, as to seal the lips of every conscientious and enlightened man who attempts to speak in its defence. I am constrained to deprecate, with horror and disdain, the dark, the damnable, perverse, and baleful doctrine of misguided ethical philosophy, which tolerates an act of iniquity and fraud, *if such act be the act of a nation*; which designates extortion by the title of refined policy; if a nation, as one man, have determined to act in concert as *unanimous confederate extortioners*; which covers political villainy with gaudy epithets, and hides the infamy and shame of a people in the frivolous delusions of insignificant verbal vanity; which encourages the national and public perpetration of deeds, the doom and consequence of which, to the performer, if performed by one individual, would eject him, as a vile, abhorred, and solitary fugitive, abroad upon the face of the earth. I am constrained to acknowledge, that if the *lion* be correctly taken for a symbol of the nobler characteristics of the British nation, the same analogy also too unhappily and closely prevails, in respect of some other less attractive traits of character which mark the royal quadruped; I am constrained to express my fear, that, if considered in reference to such a comparison, the acts of that nation have more than once betrayed a propensity — *royal in cupidity, and more than royal in rapacity*.

In the examination of the question of the frontier, which I propose to undertake, on scientific principles, in the subsequent part of this letter, many mathematical theorems are involved, of so technical a nature, that I should be guilty of gross and

contemptible hypocrisy, by pretending to presume that all those theorems are familiar to your Excellency, exercised and occupied as you have been for many years, in the responsibilities and duties of political affairs. For the satisfaction of your Excellency concerning those technical inquiries, I presume to suggest a reference, if necessary, to the mathematical authorities of *Yale, Virginia, and West Point*.

Finally, Sir, before I undertake the proposed examination, I must express the hope, that a consideration of the nature of my attempt will tend, with additional force, to impress upon your Excellency, a deep conviction of the *incalculable benefits resulting to mankind, in every conceivable department of human affairs, from the patronage, diffusion, and protection of science*. I shall rejoice, if enabled hereafter to believe, that, by any observation contained in or suggested by this letter, the attention of your Excellency, or that of any other influential man, has been more closely directed to the promotion of that glorious object.

But I cannot incur the deep culpability of neglecting to inform your Excellency, and all my fellow-men, that mathematical science, like every other human pursuit, has its vanities, deceits, and snares. More especially in later times, a race of men has appeared upon the field of demonstration, the devious meteoric aspect of whose intellectual career has induced me to apply to such individuals the epithet, *Formularian*, as a distinctive appellation. These men *shun definitions, and refuse to explore first principles*; they conceal ambiguity by apparently precise, but latently equivocal words; they accomplish, on *formulae*, unusual and curious transformations, by unjustly, though plausibly, *generalizing the ordinary rules of operation*, like certain other philosophers, who, having once discovered that a circumstance is *very generally true*, immediately arm themselves with such a discovery, as a weapon wherewith to *deny the reality of every case of exception which may afterwards occur*. The absurdities of these men are sometimes harmless and amusing; but unhappily, too often, more calamitous results ensue. Among this visionary tribe, *La Place* appears to be pre-eminent, in

propensity to mischief, and in power of performance. The splendid fictions and marvellous delusions of that unrivalled *Formularian* are pregnant with destruction; they are subversive, in their final tendency, of religion, morality, and social order; and consequently hostile to the present and subsequent happiness of men. Such individuals may be rightly regarded as the despicable *vermin* which pollute, while they prey upon, the intellectual decayed remains of Archimedes and of Newton.

Before I undertake the proposed question, I shall finally observe to your Excellency, and the public, that, concerning the promotion of science, I am sorry to perceive the existence of an error, which, in politics and literature, is equally fatal and disastrous. This error consists in the *supposed utility of domineering behavior*. One of the predecessors of your Excellency, in the exalted station which you now occupy, unfortunately tarnished, by a fatal error of that nature, the lustre of his previous reputation; but how much more indescribably contemptible is the aspect of a *domineering bully among juvenile students*, than that of a rash and arbitrary man directing the affairs of a nation! The only consideration, that operates with resistless and perpetual sway on every department and rank of human society, is the *prepossessing native dignity which peculiarly discriminates the gentleman*; and which is completely incompatible with every vestige of that repulsive rudeness, which betrays the barbarian, the ruffian, or the bear.

Finally, I now proceed, according to proposal, to furnish in detail, to your Excellency, the scientific investigation and solution of the problem respecting the disputed frontier.

INVESTIGATION OF THE PROBLEM OF THE DISPUTED FRONTIER.

ART. 1. If two parties agree to discriminate a tract of country into two several shares, by a transverse boundary, and the face of the country *present no natural obstacles*, that boundary will, beyond all doubt, be *Rectilinear*; for every curvilinear deflection or angular deviation would be a source of unprofitable toil and useless perplexity.

ART. 2. And hence if any *part* of such boundary were disputed or defaced, it might be, at any time, re-ascertained, by simply *pursuing the direction of that part which is known*.

ART. 3. But if natural obstacles occur on the face of the country, they will operate in two ways; first, by intercepting the course and precluding the progress of the intended rectilinear boundary; and secondly, by presenting, *in themselves*, a range of immutable and definite local features, which may, with facility and certainty, be taken as connecting-points through which we may imagine a boundary to pass.

ART. 4. Between the parties, however, a previous understanding must have existed, either strict, precise, and immutable, or else *restrained within certain limits of allowable adjustment*, concerning the *proportionate magnitudes and relative situations of the two shares*.

ART. 5. And hence, in the selection of such natural connecting-points, to mark the direction of a boundary, the proceedings will be governed and affected by this indispensable consideration; *so to direct such a boundary, as to violate in the smallest possible degree, the understanding which existed, respecting the situations and magnitudes of the two shares*.

ART. 6. And if the series of natural points discontinue, before this boundary has completed the extent of its course, and the said boundary, having reached the last of these points, *emerge upon the uniform face of the country, so that, beyond that point, its direction be optional*; the only consideration thenceforth existing, which can regulate the course of that *final part* of the boundary, is this: *so to direct this final part,*

as to compensate for any violation of the aforesaid previous understanding, which may, of necessity, have arisen, by adopting this train of natural points, to regulate the course of the preceding part.

ART. 7. And this consideration is equally important and decisive, at *either* extremity of the said boundary, or at *both*; the term "*final*," in the previous article, being merely adopted for facility of expression; since, of the two extremities of any such boundary, *either* may be taken as the *initial*, and the *other* as the *final* extremity.

ART. 8. The import of Articles 5, 6, and 7, connectively taken, is expressible thus. In the prescription of any such boundary, the total course of the proceedings will be governed by this consideration; *so to accommodate the several parts of that boundary to each other, as to give to the total boundary, precisely, or as nearly as possible, a self-adjusting character; that is, that all infringements of the general pre-understood conditions, which are unavoidably made in certain parts of that boundary, in favor of one party, are counteracted and recompensed by other infringements which are elsewhere made in the course of that boundary, in favor of the other party.*

ART. 9. Now, as we have observed in Article 1, that all boundaries, if not intercepted by obstacles, would be rectilineal; and as all desirable conditions, concerning the relative situations and magnitudes of two shares, can be satisfied by merely accommodating the situation and direction of a rectilineal boundary to each particular case; it follows, that, whenever the separation and distinction of two several shares is required, a straight line might be drawn *somewhere*, which would satisfy the general pre-understood conditions between the parties. Such a straight line we shall call a *Normal*.

ART. 10. From Arts. 8 and 9 we learn, that if *any boundary whatever* between two shares be *completely self-adjusted*, the following remarkable relation must be verified between *it*, and *every normal whatever*, appertaining to the same case between the same two parties. In Fig. 1, let *N n* be a normal, and *ABCDEFG* be a self-adjusted boundary, *Q q* and *R r* being exterior boundaries of the total tract which com-

prehends the two shares; then, the sum of all the areas, $\alpha, \beta, \gamma, \delta, \&c.$, which are intercepted by Nn , and those parts of the tortuous boundary which lie on *one* side of it, is *equal* to the sum of $a, b, c, d, \&c.$, which are intercepted by Nn , and by those parts of the tortuous line which lie on the *other* side of it. For, if the two sums be *unequal*, the straight and the tortuous boundary cannot *both* satisfy the understood conditions of the relative magnitudes of the two shares; since, by the adoption of *one* boundary, *one* party has a *greater* share, and the *other* a *less*, than by the adoption of the *other* boundary; but both boundaries *do* satisfy the aforesaid conditions; Nn , by its character as a *normal*, and the tortuous boundary by *self-adjustment*; therefore the two sums must be equal. $Q.E.D.$

ART. 11. Whenever a straight line bears to any other line such a relation, with respect to the intercepted areas, as that which Nn bears to the tortuous boundary in Art. 10, we shall call that straight line, a *coequator* to the other line.

ART. 12. But yet, among tortuous lines, the *general bearing* or *progressive tendency* of one, may depart from that of its coequator, much more than that of another tortuous line from its coequator. Thus, in Figs. 2 and 3, the general bearings of the tortuous lines $ABCDEF$, and $abcdef$, *exactly coincide* in direction with their coequators AF and af , while the general bearing of $abcdefgh$, in Fig. 4, is *itself* the tortuous line adi , intersecting the coequator ak , AB and CD being the exterior boundaries comprehending the total tract which contains the two shares. Whenever the coequator and the general bearing exactly coincide, the two extremities of the coequator and those of the tortuous line will *also* exactly coincide, as evidently appears by Figs. 2 and 3. This relation we shall express by saying, that, in every such case, the tortuous line preserves perfect *affinity* with its coequator; but in other cases, the *want* of such affinity shall be expressed by stating, that it more or less *diverges* from that coequator.

ART. 13. Before proceeding further, it is well to consider, *in what circumstance* this greater or less divergency *consists*. Two straight lines, which coincide in direction, make no an-

gle. Now in Figs. 2 and 3, the coequator AF , in the former case, and $a f$, in the latter, *coincides, or is identical with, a straight line uniting the extremities of the boundary to which it is drawn as a coequator*. In each case, the coequator makes *no angle* with the connecting line, and therefore we say that such boundary has *no divergence* from that coequator, or has *perfect affinity* with it, by which we mean the same thing. But, in Fig. 4, the straight line $a h$, which connects the extremities of the dotted boundary, *does* make an angle with the coequator $a k$, and therefore we say that such boundary *diverges* from that coequator. Lastly, in Fig. 5, if $a b c d$ be a boundary, and $a d$, $e f$, and $g h$, be all coequators, AB and CD being the exterior boundaries, comprehending the total tract which contains the two shares; we perceive that $a b c d$ has *no divergence* from $a d$, but it *has* a divergence from $e f$, as we perceive by the angles α and β , which $e f$ makes with $a d$. But $a b c d$ has a *yet greater divergence* from $g h$; for $g h$ makes angles with $a d$, which severally exceed the two former, by the angles γ and δ .

ART. 14. But here an indispensable remark must be made. For, since any two straight lines, which meet, will make, if produced, as in Fig. 6, *four angles equal by pairs*, as a and α , b and β , and since, if *either pair* be very small, the *divergence of the two lines* will be very small; therefore, of two adjacent angles, which one straight line makes with another, as the two angles a and b , in Fig 7; if these two be unequal, the *minor angle* is that whereby we *measure the divergence*.

ART. 15. Now as it appears from Arts. 1 and 9, that all boundaries, if not encountered by natural impediments, would be *Normals*, because boundaries of *such* a character offer to the human understanding the only obvious, primary, and immediate resource whereby to realize the pre-conceived conditions between the parties; it follows, that where a boundary has been eventually adopted between two such parties, the *first notion* of such boundary must have been that of a *normal*, which, for the sake of accommodation to existing circumstances, has been diversified and altered into that form under which it was finally adopted. In every such case, the pre-

conceived original normal we shall call the *Archetype*, and the actual boundary therefrom derived we shall call the *Metatype*.

ART. 16. Hence we obtain a test for the detection of a *spurious boundary*. For if we can collect any evidence to show that such boundary has been obtained and derived from *no normal archetype*, we have established a proof, that such boundary was never adopted as the result of the mutual deliberation of two contracting parties, but betrays a fictitious origin by the devious and distorted aspect of its general career; presenting, indeed, no unsuitable picture of the inconsistent, perverse, and guilty movements of the *creating spirit which directed it*; alternately impelled and restricted by the stimulations of encroaching avarice, and the retiring trepidation of abashed and conscious turpitude.

ART. 17. To all that feel disposed, without reflection, to denounce the principle detailed in the preceding Article, as far-fetched and fanciful, it may be well to observe, that *if* that principle be a mere metaphysical and idle conceit, the fact is very extraordinary, that, from the most primitive and unspeculating ages of the human race, down to the present time, the *universal structure of language* will clearly prove, that, from the geometrical ideas of "*Straight*," and "*Crooked*," "*Even*," and "*Uneven*," the moral ideas of "*Good*," and "*Evil*," have, *in virtue of the right of kindred*, borrowed their verbal habiliments. With moderate research, and possibly with some surprise, those objectors will discover, that "*Equity*," is "*Flatness*," and moral *Rectitude* is moral *Straightness*. They will also perceive that a "*Delinquent*" is one who *swerves* from the path of duty, so as to "*Leave*" that path lying "*Off*" or *away* from his present course. They will also further perceive, that a "*Perverse*" disposition is that which is "*Very Much Twisted Away*." To multiply examples of this kind is not necessary; they are familiar to every linguist, and clearly indicate an *intrinsic similarity* and a *usual association* of these geometrical and moral ideas, for which no satisfactory reason can be easily given, if we deny the proposition, that *a tendency to straightness will be a prevailing feature in a boundary traced for the first time between two tracts of land, under the direction of honest men.*

ART. 18. The process of deriving a boundary from its normal archetype will be evidently guided and ruled by this consideration ; *to shun mis-regulation, perplexity, and toil, by directing this boundary, so as, first, to render it self-adjusted, whereby the normal archetype will be its coequator ; and secondly, so as, if possible, to have perfect affinity with its normal archetype, or else to diverge from that archetype in the smallest possible degree.* A familiar illustration of this case may be drawn from that of a traveller, who, being led by another person through an unknown country, *will deviate from the track of his guide as little as possible.*

ART. 19. Hence we obtain a satisfactory test whereby we may discover, at least in extreme cases, *whether any boundary has been derived from a normal archetype, or fabricated on some other principles.* For if we can discover that such boundary *diverges extravagantly* from each of all its possible coequators, we have clearly a strong presumption that such boundary *was not obtained from any normal archetype ;* and, on the other hand, if we discover that such boundary has *one* coequator to which it has *perfect affinity*, or from which it *very slightly diverges*, we have an equally valid presumption of the opposite kind.

ART. 20. But a question may occur, of the same general nature, but under a different form, wherein the preceding test may be safely applied, not only in *extreme* cases, but in *any* case. For if *two boundaries* be placed, from the peculiar cause, which gave them origin, or from any other circumstance, under such conflicting conditions and relations, one to the other, that *one* of these boundaries *must* have been *derived from a normal archetype*, and the *other* must have been *fabricated on other principles ;* and if we ascertain that we can draw to one of these boundaries a coequator to which it has *perfect affinity*, whereas none such can be drawn to the other ; or else, if we draw to each boundary that coequator from which it has least divergence ; and then discover the divergence of the former boundary from such coequator to be less than that of the latter from its own coequator ; we obtain thus, for the *former* boundary, a *cause of preference* before the *latter*, which decides the question.

ART. 21. It is also observable that sometimes a coequator may be *parallel* to the straight line which connects the extremities of the boundary, as *de* to *ac*, which connects the extremities of the boundary *abc*, in Fig. 8; or, though not parallel, may not meet that straight line, *unless both be produced beyond the total tract*, as the coequator *fg*, in Fig. 9, meets *a* in *g*, the exterior borders of the tract being *ABCDE* and *FGHI*. All such coequators we shall designate, for the sake of distinction, as *Remote*, and all others as *Adjacent*. From the extreme difficulty, however, of directing an adjusted boundary by any such remote coequator, it is needless to say that *no* boundary has ever been derived from such a coequator as its normal archetype. In the examination, therefore, of the comparative claims of different boundaries, to a genuine origin from a normal archetype, we have no cause to make any inquiry with respect to *remote coequators*.

ART. 22. If two boundaries be so circumstanced, that *one must be spurious and the other genuine*, but—*which to acknowledge as genuine,—and which to reject*—we are uncertain; the only necessary aid, which has not yet been furnished for the settlement of such a question, is a process whereby we can try the question of *greater or less divergency*, as stated in the preceding Articles. For, by *such* a process, we can presumptively ascertain, as appears by those Articles, *which* of those boundaries has been derived from a normal archetype, and which was fabricated on other principles; and again by Art. 16, from the discovery of these latter facts, we are immediately enabled to discriminate the spurious from the genuine boundary.

ART. 23. From each of the two extremities of any boundary a coequator to that boundary may be drawn. For, let *any* straight line, as *de* in Fig. 10 and 11, be drawn from one extremity, as *d*, of a boundary *abcd*, till it meets the opposite exterior border of the tract in *e*; *de* either *not again meeting the boundary*, as in Fig. 10, or *again meeting it one or more times*, as in Fig. 11. In the former case, let the area of the space comprehended between the boundary *abcd*, the straight line *de*, and the border *ae*, be calculated and represented by

Δ ; it is now an easy geodesic problem, to determine the position of a straight line, as the dotted line da , which will make the space comprehended between itself, de , and the border, equal to Δ . The straight line da is the required coequator. For since de augments one of the shares, as determined by the boundary, by the quantity Δ ; and again da diminishes by the same quantity Δ , the share which has thus been augmented; that share, and consequently the opposite one also, is now restored to its former value; that is, da is a coequator. In the latter case, let all the areas intercepted by de , by the boundary, and by the opposite border, on one side of de , be collected into one sum; and let all such areas on the other side of de be collected and summed in the same manner; and if, on one side, no intercepted area be found, the sum of such areas on that side may be stated as equal to zero; take the difference of the two sums, and denote it by δ ; then, upon that side of de , where the sum of the intercepted areas is greater than the other, draw df , so as to make the space comprehended between itself, de , and the border, equal to δ ; then for the same reasons which were assigned in the preceding case, df must be a coequator. Every coequator, which meets one of the extremities of a boundary, shall hereafter, for the sake of distinction, be styled *Conterminal*, and every other coequator, *Disterminal*.

ART. 24. All coequators to the same boundary must meet and intersect within the exterior borders of the total tract which contains the two shares. For if two straight lines meet on such exterior border, as ac and bc , Fig. 12, which meet on the border CD ; or if they meet neither on nor within such border, as ac and bd , Fig. 13; then one of the two shares, determined by one of these straight lines, is augmented by the other straight line, without any counteracting diminution; therefore they cannot be both coequators. Therefore any two coequators must intersect within the borders, as ab and cd , Fig. 14.

ART. 25. And hence it immediately results, that, from either extremity of a boundary, we can draw but one coequator;

that is, to every boundary, we can draw *two, and only two* conterminal coequators; and, in the case of *perfect affinity*, these two coincide in direction, and thus, in a certain sense, become *one*.

ART. 26. Of all coequators drawn to the same boundary, remote ones excepted, one of the two conterminal coequators is that which has least divergence. For, in Fig. 15, let a and b be the two extremities of a boundary, which it is not necessary here to represent; let ac and bd be the two conterminal coequators, intersecting in g ; let ek be any other coequator which is not remote, intersecting ac in h , and bd in i ; because ek is not remote, it meets the connecting line ab , at some point f , between a and b ; now of the triangle bfi , the exterior angle α is greater than the angle at b ; and of the triangle afh the exterior angle β is greater than the angle at a ; therefore, of α and β , the *minor one*, if these be *unequal*, or *each* of them, if *equal*, is greater than one of the two interior angles at a and b ; that is, in any case; *one* of the two interior angles at a and b , is *less than each of the angles* at α and β . Of that interior angle and its adjacent exterior, if the interior be the *minor* angle, or if both be *equal*, the conterminal coequator, to which that angle appertains, must have less divergence than ek ; but if the adjacent exterior angle be the *minor*, then, since the interior angle is less than each of the two angles α and β , *a fortiori*, the exterior angle, which is *now the minor*, is less than each of the angles α and β ; therefore, in every possible case, one of the two conterminal coequators has less divergence than ek . Q. E. D.

ART. 27. Hence, if the conflicting claims of two boundaries be such, that *one must be spurious and the other genuine*, we have the following practical rule for a decision of the case. *To one boundary, draw both its conterminal coequators, and ascertain the divergence of each, selecting the lesser divergence, or either, if equal, as the least possible which that boundary can have with any coequator which is not remote; in like manner, discover the least divergence, in the case of the other boundary; compare these two results together; then, whichever boundary affords the*

less result, we obtain, by the principles detailed in the preceding articles, a preponderating evidence in favor of that boundary.

ART. 28. By the mere mental substitution of *arcs of great circles* for *straight lines*, the whole preceding theory, with scarcely a verbal alteration, becomes directly applicable to all cases, in which, from the large extent of the total tract, we may suppose the *rotundity of the terrestrial surface* to have any perceptible effect on the question.

ART. 29. But, in the practical application of this theory, the following indispensable precaution must be observed. Through all the preceding investigations, the extent of any one boundary is conceived to be that wherein it *separates, every where, the previously undetermined shares of those two parties, and of those two parties alone*. And therefore, if a boundary be part of a continuous frontier; and if that frontier, in other parts of its course, be a boundary to shares predetermined between the same two parties, or a boundary at all appertaining to any share of any third party; if we would apply the preceding investigation to this first boundary, we must first ascertain *how much* of that frontier *constitutes* this boundary, by discovering on *what points* of that frontier *the extremities of this boundary fall*.

ART. 30. Hence, in the application of the preceding process to an examination of the two boundaries respectively claimed by the American and British nations, on the frontiers of New Brunswick and Maine; we should first ascertain *where the common westward extremity of the two conflicting boundaries lies; that is, to what extent westward, in 1783, the boundary established in that year separated British from American territory*. The true answer to this question seems to be, that such boundary was *bona fide* a boundary between the United States and the British possessions, through all its westward course *till it first reached a branch of the Mississippi*; as every part of the region westward of that river, at least as far as to the Rocky Mountains, appears to have been, at that time, either *Indian* or *French* territory. This question, however, being subject to the decision of historical research, its further consideration is unnecessary *here*.

AN EXAMINATION OF THE TREATY OF 1783:
 FROM WHICH IS DERIVED
 A DEMONSTRATION OF THE FALSEHOOD OF
 THE BRITISH CLAIM,
 AND ALSO OF
 THE TRUTH OF THE AMERICAN.

ART. 1. An *angle* of any superficial figure, lies at a point where *two sides of the figure meet*, as the point *A* in Fig. 16.

ART. 2. Two sides of any such figure can meet *only at their extremities*.

ART. 3. Hence the angles of any such figure can exist only *at the extremities of the several sides*.

ART. 4. Hence, any such figure has no angle at a point on any of its own sides, *between the extremities* of that side.

ART. 5. It may easily, however, have an angle of *another* figure, or *several* angles of as many several figures, at such a point on its own side, between the extremities of that side; as the angles *a* and *c*, at the point *b*, in Fig. 17, where *AB*, *BC*, *CD*, and *DE*, are sides of a figure whereof the total representation is not necessary here; and *b d* is a common side of two other figures, whose representation is also unnecessary.

ART. 6. Before, during, and after the preparation of the treaty of 1783, for a certain space of time, the two tracts of country, which are now called Nova Scotia and New Brunswick, were comprehended under the common appellation of

Nova Scotia. See the article, "*Nova Scotia*," in the *Encyclopedia Americana*, and also in Dr. Rees's *Cyclopedia*.

ART. 7. In that comprehensive sense, we shall employ the term in this examination.

ART. 8. Now it appears from the map of Lower Canada, with adjacent parts of the United States and Nova Scotia, published by the *British "Society for the Diffusion of Useful Knowledge,"* that *one side* of Nova Scotia, namely, the *western*, is a line extending *North* and *South*, as *BC* in Fig. 17; whose northern extremity *C* meets *another side*, namely, *CD*, and its southern extremity meets the Chiputnaticook river, which, by the line of its progress to Passamaquoddy Bay, makes a *third* side. It also appears from that map, that, according to the British claim, the "*northwest angle of Nova Scotia*," specified in the treaty of 1783, lies on the point *b*, of the side *BC*, *between the extremities* of that side, and *b d* is a *common side* or *boundary* of the United States and of Canada. But, by what we have shown in articles 4 and 5, the angle *a* would, in that case, be the *southeast angle of Canada*, and the angle *c* would be the *northeast angle of the United States*; but Nova Scotia has *no angle whatever at the point b*; therefore *the British claim must be false*.

ART. 9. But, by the American claim, the northwest angle of Nova Scotia lies at the point *C*, where undoubtedly there is an angle of Nova Scotia; which angle, being also the *only* angle of Nova Scotia which is made by the *northern extremity* of the side *BC*; it *must* be the northwest angle of Nova Scotia, specified in the treaty aforesaid. Therefore, *the British claim is false, and also the American is true.* Q. E. D.

I cannot conclude the foregoing investigations, without acknowledging my obligations to Dr. J. D. Hedge, of Cambridge, for the kind and active manner in which he has labored to ensure the correctness, encourage the publication, and promote the success of this work, by the removal of many prac-

tical difficulties, which, otherwise, if not insurmountable, would have created extreme delay and embarrassment ; more especially I refer to the exertions of that gentleman for the facilitation of my access to authorities and documents, which I should otherwise have found it extremely difficult, if not impossible, to procure.

Finally, Sir, having now completed a task, in the performance of which I have been animated only by an impulse of duty, combined with an encouraging hope of inheriting a share of that immortal celebrity, which the man who benefits his race by intellectual achievements may extort from the grasp of an unwilling world, and retain to the latest extent of human posterity ;

I subscribe myself,
with great respect,
your Excellency's
obedient servant,

JOHN LEE.

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